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COLLEGE OF AGRICULTURE
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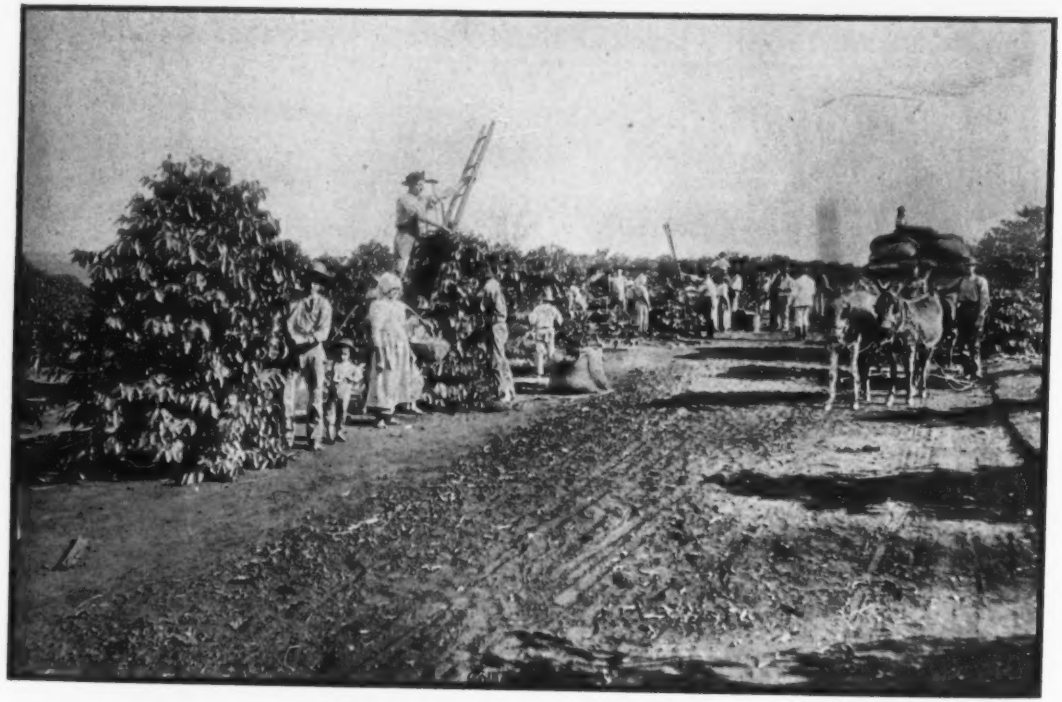

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THE CORNELL COUNTRYMAN

Vol. I JANUARY, 1904 No. 2

THE FARMERS' READING COURSE MOVEMENT

1. THE POINT OF VIEW

By S. W. Fletcher

Supervisors of the Cornell Farmers' Reading Course

THE dominating spirit of the times is the spirit of altruism—an unselfish interest in the welfare of others. Most unfortunate is the man who looks out upon the world of to-day and sees only its selfishness and greed. More than likely he has the distorted vision of one whose knowledge of the world is gleaned chiefly from the columns of our daily press, with their nauseating details of crime, scandal, corruption, sordidness—all that is unlovely in life put in, colored and amplified; all that is sweet and unselfish left out. We hear much about "grinding trusts" and "soul-less corporations." Somebody takes pains to tell us that the law of competition which governs business the world over, is "Get the most you can and give the least you must." We hear that the poor are taxed by the rich; that the weak are oppressed by the strong. In the opinion of many of these lack-lustre eyed, vinegar-faced philosophers, as life is becoming more strenuous, it is also becoming more selfish.

This is true only in part. In spite of the strong currents of selfishness which are set in motion by the fierce competition of our modern industrial system, there are stronger counter-currents of unselfishness. It is not egotism which leads us to believe that never before have men and women been so generally concerned about the welfare of others. Like the Jewish lawyer many centuries ago, they are asking the Great Altruist, "Who is my neighbor?" and are trying to follow the teaching of the parable which He gave in reply. Never has there been so little of sect and caste; so much of fellowship and brotherhood.

This growing spirit of altruism is manifest not only in persons but also in communities and peoples. The wonderful development within the past few decades of free schools, free libraries, free hospitals, free museums and other public institutions for promoting the happiness and usefulness of the people, has no other significance but that the public conscience has been quickened to a sense of its responsibility toward the individual. Never has the body politic taken such a sympathetic interest in the welfare of the individual. This is not the growth of paternalism or of socialism. It is the growth of the idea of universal brotherhood. This idea is nearly 2,000 years old.

Education has been touched by the altruistic spirit. For centuries the door of knowledge was jealously guarded by monks and doctors. Only the rich and influential, that is, the few, might enter therein. Is it very long since the days when there were considered to be but four "learned" professions—law, medicine, theology and teaching? How many are there now? One by one the barriers are being broken down and the common people are entering into the possession of their birthright—the right to expect and to receive training in any legitimate vocation which they desire to make their life work. The establishment of the Land Grant Colleges of Agriculture and Mechanic Arts was a signal advance toward the realization of this ideal. These institutions have done more to democracise education than any other single factor, and their influence will continue to be exerted along this line until every industry in which men and women are engaged has been put into pedagogical form.

But the fact remains that the vast

majority of people do not go to colleges or training schools. Many cannot; a much larger number will not. Because they either cannot or will not, does our responsibility towards them cease thereby? It is the old, old question, "Am I my brother's keeper?" Shall we say to the ambitious young man, who is so bound by home ties or other circumstances that he cannot go to college, "My lad, you are most unfortunate. We are very sorry for you," and go our way? Shall we say to the unambitious young man, whose early training and environment has been such that he has no desire to bring into his life the beauty and power of education, "Very well, sir. If you prefer to remain in ignorance it is your fault, not ours, and you must suffer the consequences?" The spirit of altruism in education leads us to try to help each of these men. If they cannot or will not turn to the light we must carry the light to them.

The altruism which has seized modern education is expressed in many ways. The Farmers' Institute is one way; the Home Education work of our State Library is another. Perhaps it is best illustrated in what is called University Extension Teaching—literally an effort to extend the inspiration of University teaching to those who cannot attend the University. Some Extension Teaching is conducted by means of public lectures; some by means of reading courses; some by means of personal visitations. There is Extension Teaching in the Arts, in Literature, in the Sciences, and there is Extension Teaching in Agriculture.

The Farmers' Reading Course movement is a part of the University Extension Teaching in Agriculture. Of all people the farmer is the hardest to reach in Extension Teaching. This is not because he is less eager to learn than other people, but because he is a conservative. The nature of his work and the comparative isolation of his life tend to make him tenacious of established ideas and slow to accept innovations. Farmers are the great conservative element in our body politic. So it was only natural that the early efforts in the extension of agricultural education were viewed with suspicion by many farmers and with derision by others. But all of this is passing away. We hear less and less about "book-farming." "Scientific farming" and "practical farming" are merging so rapidly that they will soon be synonymous terms.

Extension teaching in agriculture is of far greater importance than extension teaching in any other subject, not only because agriculture engages the attention of so many more people than any other industry, but also because such a relatively small number of farmers are so situated that they can attend agricultural training schools or colleges. The attendance at most of our agricultural colleges is rapidly increasing, and one does not need to be unduly optimistic in order to predict that before the end of this century the agricultural course will be as largely patronized as any other course in the curriculum; but even then, most farmers will never see the inside of college walls. They must be reached by extension teaching. As children they must be interested in the natural world around them; in birds, flowers, stones and the majestic procession of the seasons, so that they may learn to love country life and the environment in which they are placed. This effort has been called nature study. As lads, they should be shown something of the wonderful alchemy of the soil, how plants eat and drink; how the farmer prospers only when he questions the soil and studies the plant. This type of effort is being introduced as "Elementary Agriculture in the Public Schools." As men, they should be brought into touch with the vital problems of their profession (I use this term advisedly) by means of Farmers' Institutes and Farmers' Reading Courses.

The Farmers' Reading Course movement, therefore, is best interpreted from the point of view of altruism. It is but one feature of a general tendency in modern education. It is not conducted for political effect. It has the ring of earnestness and unselfishness. The men who have been identified with it have put their heart into

the work, and, in most cases, have not expected or received any recompense except the joy of service. The extension movement, of which it is a part, is bound to grow, because it is the expression of a truth which must some time possess the world—a truth to which a wise man once gave concrete form in the words, "We that are strong ought to bear the infirmities of the weak."

IRRIGATION IN HUMID DISTRICTS

By E. B. Voorhees

Director of the New Jersey Experiment Station

THE question of irrigation in the humid districts has recently assumed considerable importance, and is probably due chiefly to two causes, first, the general discussion of the subject of irrigation, as a result of the action of the National Government in providing for the irrigation of certain public lands in the arid regions; and, second, to the fact that in the eastern sections of the humid districts there have been very radical changes in the character of the farming. Extensive systems of farm practice, in which cereal grains and hay have been the chief crops, have changed to more intensive systems, in which market garden crops and small fruits are more generally grown. The effect of lack of moisture, due to short periods of drouth, is more noticeable in the case of these quick-growing crops of high commercial value, than for those whose periods of growth are longer and whose value is lower, though possibly the relative effect would not be far different.

The Amount of Rainfall Not a Guide as to the Need for Water.—It has been shown, that while the rainfall in the humid districts is on the average sufficient to meet the demands of vegetation, it is not altogether a question of actual rainfall, but a question of its distribution and character. That is, if the total rainfall of these districts were so adjusted as to have the precipitation at the proper time, and in such a way as to enable it to be entirely absorbed by the soil, there could be no question as to its complete efficiency, but the rain that falls during the summer months is often of little service; the dashing showers do not readily penetrate the soil when hard and dry, and a largt proportion runs off the surface and is lost. Thus the statements of annual rainfall, of monthly rainfall, or even of that during the growing season, are not safe guides as to possible utilization in crop-growing. In a large percentage of years, there are longer or shorter periods during which the deficiency of rainfall is serious, and in every year there is usually one or more crops of the wide number now grown, that materially suffer from lack of sufficient moisture at the right time. A slight deficiency of water at critical periods in the growth and development of these high-class crops is often disastrous, and these short drouths are of very common occurrence in our humid districts.

Difficulty of Establishing Irrigation in Humid Districts.—A difficulty met with in irrigating in the humid districts, is that the amount of water required in addition to that annually precipitated is not readily determined, because of the variations in the annual precipitation, as well as in the character of it, that is, whether evenly distributed throughout the growing season, or whether in heavy storms in which case the excess is carried away. In certain years, very little additional water may be required, while in certain others a very large amount, thus the problem of water requirements is a much more complicated one than in the arid regions.

Another matter which prevents active interest in the irrigation question by those directly affected, is the inherited tendency to let well enough alone, and to take the chance upon

having a sufficient precipitation for the annual requirements. Hence, the adoption of any system of storage and distribution, which is based upon a careful study of the water requirements and the gains that may be derived from an abundant supply, does not meet a ready support, and capital for the building of storage reservoirs and distributing canals is not easily obtained. In the arid regions, the case is different; there is no element of chance; without water, nothing can be grown, and hence when it can be shown that water can be obtained, capital is ready to venture, but in the East any scheme of irrigation involving considerable expense is not likely to meet with approval until the farmers themselves take the initiative and show that such investments will prove profitable. It is for this reason too, that the experimental inquiries concerning irrigation in these districts have been carried out in a small way. When the work has been done, plants have been installed at a small expense, and the areas covered were relatively small, but these experiment plants have shown that irrigation is a very profitable undertaking.* There are now a considerable number scattered throughout the market garden districts, near the large cities of Boston, New York and Philadelphia, and throughout Long Island and New Jersey. These plants, costing from $200 to $2,000, are capable of providing for the needs of areas ranging from 2 acres up to 20 or 30, and the water is obtained from wells or streams, and pumped direct to the land or into reservoirs, and distributed as needed. In many cases in the vicinity of cities, the cheaper method is to obtain the water direct from the city supply, in which case the water is purchased only when needed, and there is no initial expense for plant, or for depreciation in value. Those who irrigate, state that they would not farm without a guarantee of water and regard it as their best and cheapest insurance.

Methods of Practice.—In irrigation in the eastern districts, if full duty of the water is to be obtained, the land upon which it is to be applied should be carefully prepared and measures taken to conserve, not only the natural, but the artificial supplies. The character of the soil and subsoil, the distance of the ground water from the surface, and the slope of the land, are all factors to be taken into consideration, and both the method of application and the quantity used should be adjusted to meet these conditions. It must be remembered, that in these eastern soils, water is not the only requisite as is the case in the arid districts. The ground must first be made fertile, and because of the larger crops consequent upon irrigation, there will be a greater necessity for supplying fertilizing materials than if the crop fails for lack of water once in two or three years. The time of applying the water, is also a matter of considerable importance in these districts, for it is quite possible to ruin a crop by excess of moisture due to the application of too large quantities previous to a large precipitation of rain. The amount of rain and the time of the fall cannot be foreseen, hence in applications in humid districts, small and frequent applications are better as a rule than thorough soakings, as is the practice in the arid regions. This tendency to injury from irrational applications of water, is due both to the character of the crops usually grown under irrigations, and to the climate. The application of a large amount of water, followed by a storm of two or three inches of precipitation, and this followed by damp, muggy weather, frequently results in encouraging the rapid spread of blights, diseases, rots, etc., which prove quite as disastrous as a deficiency of water. This is particularly true in the case of melons, potatoes, cucumbers, tomatoes and other high-class market garden crops. It would not be the case, at least, not in such a degree, with cereal crops or grasses. In the work, therefore, the attempt should be to keep the land moist. That is, begin irrigation before the soil gets dry, and add sufficient water to keep it moist. This, of course, is more expensive than a thorough soaking, but danger of injury is avoided.

*See Bulletins Nos. 36 and 87, Office of Exp. Sta., Dept. Agr., Washington, D. C.

THE COFFEE INDUSTRY IN BRAZIL

By E. Fagundes, '05

COFFEE belongs to the immense tropical family (Rubiaceæ) to which also belongs the Peruvian bark tree. It is probably a native of Arabia or Abyssinia. Its name was given by the Arabians.

Not much is known of the history of the coffee tree. The Greeks and Romans were not aquainted with it, and it is doubtful whether in its native country it was known before the fifteenth century. Toward the end of the seventeenth century some trees were taken by Wieser to the Botanical Gardens of Amsterdam where they were planted, and from whence a tree was obtained by the Paris Botanical Gardens. From this one those found later in Martinique were obtained, and it was not long before all the West Indies could be supplied with trees from that country.

About 1742, coffee was introduced into Brazil, where, owing to the condition of the soil and climate, it was soon seen that a large crop could easily be obtained. Everybody that could began to plant coffee, and its growth was so rapid that to-day Brazil produces the largest part of the world's coffee crop.

The following table, furnished by the Bureau of Agriculture in San Paulo, Brazil, shows the total annual production of coffee for the coffee-producing countries, counted in bags of 60 kilograms (about 132 pounds):

	1880-'90	1890-1900
Brazil	11,000,000	14,840,000
Venezuela, Colombia, Mexico, West Indies	4,575,000	6,370,000
Asia	3,810,000	2,085,000
Africa, Arabia	235,000	398,000
Total	19,620,000	23,693,000

We have reason to think that the different climates to which the coffee was carried had some effect on its quality, for we find that the coffee from Arabia, the Mocha, has a small, gray to greenish bean; that from Java or the West Indies, a large yellow bean; that from Jamaica is of medium size, and the bean is greenish; the Bourbon is small, yellow, almost white; the Surinam has the largest bean of all the varieties, but is of about the same color as the Bourbon.

In general, all the varieties grow more or less well in Brazil, but experience has shown that the Bourbon is the best. It lives longer and produces a large crop every year, so that one can depend upon it. The coffee tree grows very well in a place where the temperature ranges from 60 to 90 degrees Fahrenheit. In most parts of Brazil it grows better on high land, at from about 1,830 feet above the sea level, to not much above 2,440 feet. It has been found that the temperature between these heights is the one best suited to the tree, for when planted above the upper limit the frosts will kill it, and when planted below the lower limit, it grows accustomed to a higher temperature which is not the one best suited for the plant, and is, therefore, easily killed by a light frost. The plant likes a very rich soil full of organic matter. A heavy, well drained, loamy soil with some coarse gravel is ideal. Where this cannot be obtained a sandy or gravelly loam does fairly well, bearing uneven crops for not more than forty years. In an ideal soil there have been cases where the plant has reached an age of from eighty to a hundred years.

In many plantations the trees are set at the corners of squares of from 10 to 12 feet on a side, but some prefer planting them at the corners of triangles instead of squares. The most common way of planting is from the seed. These, five in number, are placed in a hole one foot square, one seed at each corner and one in the center. They are then covered with about two inches of earth and protected by a wooden crate laid over the holes. The young plants are protected from light frosts that occur on low ground during the winter, by further covering the wood cases with straw or brushwood.

The plantation is kept free from weeds The dead plants are replaced by others from the nursery, which is a shady, moist place in the woods, where seeds are sown and allowed to grow promiscuously. After two years of protection they are uncovered, for they are then strong enough to stand any slight change in the weather.

In Arabia the wild tree attains a height of 15 to 25 feet, but under cultovation it seldom exceeds 10 to 15 feet. A tree one year old is about 20 inches tall. It attains its maximum height at about six years.

The dark green leaves and the small, snow-white flowers form a very pleasing sight en masse. When going through the coffee regions of Brazil, the traveller's eye is delighted for hundreds of miles by the only snow he can see in that country—the flowers of millions of coffee trees. These give a splendid picture of a field covered with snow ten to fifteen feet deep. At other seasons the trees are covered with a luxuriant dark green foliage, making an entirely different picture. Later the berries begin to show, and it is not long before they are of a dark scarlet color, and are ready for picking. They ripen in February. The plantation is then at its busiest, and one can see many families of laborers harvesting the fruit. A cloth is spread under the tree, and the hand is run from about the middle towards the outside along the branches bearing fruit, care being taken not to injure the leaves at the tips of the branches. From the cloth the fruit is carried in carts to the drying yard, where it is spread out on flat ground or, better still, on cement yards. Here the fruit is dried by the action of the sun's rays, it being frequently turned over so as to dry evenly. When the drying process is about half complete, the coffee is placed in cement tanks filled with water, so that all impurities are removed. From these tanks it is again taken to the yard where it is left until thoroughly dry. Where the soil is heavy and compact, the fruit is allowed to fall to the ground when picked, and left there for two or three weeks, whence it is taken to the drying ground and run through the process above described. After the second drying, it is run through several mills, which remove the skins enclosing the seeds or berries, and assort the grains according to size, form and weight. It is then shipped in bags of sixty kilo-

DRYING COFFEE

grams to the several seaports for exportation.

Coffee, as well as many other articles on the market, is subject to a great deal of adulteration. Chicory is generally used for the adulteration, as it is not injurious to health. Any one can easily detect its presence, because it unduly darkens the color of the beverage. Sometimes roasted corn or beans are used instead of chicory, but these are still more easily detected, for they effect the taste and aroma. In Sumatra the coffee leaves are used instead of the seed for making the beverage. They are prepared in a manner similar to that employed with tea leaves.

When roasted, coffee loses 15 to 25 percent in weight, and gains 30 to 50 percent in bulk. It should not be roasted after it attains the brown color that is sufficient to bring out the delicious aroma and other qualities. If the roasting is carried on further, more or less charring results, and a disagreeable burnt odor is produced. For use it must be ground to a very fine powder; for only then can it give out all its aromatic oil and almost all the nutritive substances to the hot water. The beverage can be prepared in many kinds of apparatus, some of which are of rather intricate structure. The best ones are those that give the strongest beverage and at the same time keep it free from all sediment. Coffee with a sediment is not considered good by the Brazilians, who, as a rule, are great coffee drinkers.

In the tropical countries coffee is usually drunk pure, as a strong, black liquid; but it is also used with milk—three parts of the latter to one of coffee being a good proportion. The milk and the coffee are mixed and boiled for some minutes producing a much better beverage than when the milk is added immediately before serving.

A much quicker and better method is the one known in Brazil as the coador method, and in the southern United States as the drip bag method. It consists in passing boiling water over the coffee which is in a cotton bag, and allowing it to drip slowly. The beverage made in this way possesses more flavor and aroma than when made in machines or by the common way of boiling the coffee and water together.

In almost every city in Brazil several coffee houses are found, which sell the beverage by the cup at any time of the day and at almost any time of the night. Here it is dealt out according to the popular formula—"as black as ink, as sweet as love, and as hot as ——." At night the sound of an orchestra is heard. Only the middle and higher classes of people are to be found in these houses. They make very convenient places for the people to meet and discuss politics, while they enjoy their favorite beverage.

THE NEW TREATMENT OF MILK FEVER IN COWS

By James Law

Director of the New York State Veterinary College

THIS affection has been a steadily growing evil among dairy herds of advanced milking breeds, becoming not only increasingly prevalent, but more and more fatal, so that it has become justly a cause of dread on the part of the owners of valuable stock. Its intractable course and uncertain nature have led to the promulgation of a variety of theories of its pathology, and to the designation of it by a number of different names. In England it has been known as *puerperal fever*, and *parturient fever*, and, better *parturition fever;* in France and Germany as *calf* or *calving fever* (*vitulary*), again as *parturient collapse, calving paralysis, calving paresis, calving coma, parturition septicaemia, parturition eclampsia, etc.*

Theories of Causation and Nature.

As the disease follows easy parturitions (not severe ones) Contamine attributed it to the surplus of nerve force, which was not used up in calving, and now makes a sudden

explosion. The partial bloodlessness of the brain is attributed by Billings to the contraction of the cerebral vessels under the exaggerated excitability of the uterine nerves. But the womb in such cases is in a condition the opposite of excitable Hanbner attributes the bloodless brain to the accumulation of the great mass of blood in the now empty and flaccid abdomen. But the womb usually contains little blood, and the bowels (portal system) are not specially congested Franck ascribes brain anæmia to excessive plentitude of the elaborate arterial network at the base of the brain (*rete mirabile*), the swelling of which drives the blood out of all other structures inside of the closed box of the cranium. But ewes, goats and sows have equally elaborate *rete mirabilia*, yet milk fever is unknown among them, or in the males even of cattle, in farrow or even in breeding cows, apart from the period of calving. Barlow, Kohne, Carsten Harms, Binz, etc., invoke an impairment of the function of the ganglionic nerves, and a failure of conductivity of nerve force, which is purely speculative as a primary or main cause. Violet, Sanson, Campbell and others look on it as essentially a congestion of the nerve centers, while Muller and Trasbot allege inflammation of the same parts.

Apart from all such attempts at explanation on hypothetical bases, there are certain facts, that have been recognized for a great while, and which no speculation can controvert; and any doctrine of the disease, which shall stand criticism must harmonize with these indisputable facts.

Milk fever is peculiarly a disease of heavy milking cows, and no other class of animal has been bred up to the same exalted standard of great power of digestion and assilimilation, and enormous yield of milk. The disorder is virtually unknown in scrub or common herds, while it is common and deadly in the great milking breeds —Holstein, Guernsey, Jersey, Alderney, Dutch, Flemish, Ayrshire, Swiss, Norman, red polled and milking shorthorn.

Again it is unknown with the first or second calf, and becomes increasingly rare as the animal passes its maximum of milk yield and enters on the stage of decline. From six to ten years of age furnishes by far the greatest number of cases.

Heavy and rich feeding prior to and just after calving renders the disease relatively common and destructive, and hence the affection can be to a large extent warded off, by starving for a fortnight before and a week after calving.

All of these conditions operate toward one end, a suddenly induced plethora in the calving cow, and this is further shown in the small size of the blood globules, which implies a dense rich condition of the plasma in which these float. The sudden contraction of the womb after the birth, and the more speedy secretion of the water than of the solids of the blood tend to the further concentration of this liquid. Plethora therefore, both as regards excess and richness of blood, is one of the most marked and essential conditions of milk fever.

The *absorption of toxic matters* has been growing in favor as an explanation. Lafosse thought poisons were absorbed from the womb, Adadie and Kaiser from the intestines, Hartenstein from the overworked muscles, Allemani and Gratia from the udder But the womb shows less putrefactive change in its contents than after a difficult and assisted parturition, and the muscles are greatly more overworked in prolonged, obstructed and painful calving, than in the easy one in which milk fever habitually occurs. There seems therefore a strong probability that the source of the poison is to be found, if at all, in the udder.

It has been strongly suspected though not yet proved, that the source of the poison is a microbian ferment and microbes are not uncommon in the milk ducts apart from this disease The probability of a microbian origin is greatly favored by the fact, as noted by Bissauge and the present writer that certain hamlets and farms habitually furnish cases of milk fever, while neighboring ones, with the same breeds and apparently the same management

escape; also, by the observation of Russell and Wortley Axe, that the malady will sometimes be suddenly arrested in a herd, by the simple expedient of having the cows moved to a new and previously unoccupied stable, for calving and the first nine days thereafter. The sudden prostration, muscular weakness, unconsciousness and coma, are strongly suggestive of a narcotic poison of microbian origin, and the rapid and complete recoveries are equally in keeping with such theory, the poison having been presumabally eliminated or neutralized in the system. Any marked structural change producing equivalent nervous disorder would make no such rapid improvement. Dangerous narcotic poisons (leucomains) may, however, be generated in the system without an invasion of microbes from outside, as when ephemeral fever follows on overexertion or when the milk becomes poisonous when unduly retained under overexertion and excitement. The suckling is often poisoned under such conditions, and everything points, as we shall see under treatment, to the origin of milk-fever-poison in the udder.

The presence of poisons in the system is further shown in the constancy with which we find *sugar in the urine* in these cases. This points very directly to disordered function of the base of the brain or liver. It should be stated that the mere presence of sugar cannot be looked upon as the cause of the milk fever, as the elimination of sugar continues for days after the cow has virtually recovered and is apparently quite well. The quantity of sugar in the urine, however, is in ratio with the violence of the attack, and therefore it is an index to the amount of the real narcotic poison produced in the system.

A wide *variation of temperature from the normal* is another indication of the violence of the attack, and its gravity. If much below the normal it implies a specially depressing narcotic poison and a probably fatal issue. A slow rise to (not above) the normal is a favorable indication. A rise above the normal usually implies inflammatory complications, in the lungs, through inhalation of food products; in the bowels; in the womb or elsewhere. All such cases are to be dreaded as the system becomes further depressed by the toxins furnished by the microbian invasion of the inflamed part, in addition to those already furnished from the udder. Such accessory infectious inflammations may well render unsuccessful the best measures of treatment

The J. Schmidt Treatment.

In 1897 J. Schmidt published his succesful treatment of milk fever by the injection of the teats and milk ducts with a solution of iodide of potassium 7 to 15 grammes in 1 litre boiled water. The solution must have been boiled for 15 minutes and cooled to 40 degrees C. before injecting. The apparatus for injecting is a small rubber tube, five or more feet in length, having a milking tube fitted into one end and a funnel into the other. This is to be rendered asceptic by boiling, and kept there after in a solution of mercuric chloride (1:1000) until wanted for use. The udder and teats, the hands of the operator and assistants, are thoroughly washed with soap and water, rinsed off with boiled water, and then soaked in a solution of carbolic acid (2:100). The udder is milked empty before disinfecting, and is manipulated after the injection to force the liquid into all parts of the milk ducts.

As the result of this treatment the mortality was reduced to 17 per cent. instead of 50 or 70 per cent. under the old treatment.

The avowed object of Schmidt was to check secretion in the glands, for which iodine was especially promising. He soon advised the introduction of a little air into the udder to favor the diffusion of the iodide solution. Others went a step farther, thus Naudinat doubled the amount of the iodide solution injected, and used eserine and pilocarpine hypodermically to arouse the peristalsis of the intestines, and reduced the mortality to 5 per cent.

The Injection of Other Liquids.

The great success of the Schmidt method inspired a number of veterin-

arians in both Europe and America to inject the udder with other antiseptic solutions, all of which proved successful in a high degree. Among the solutions injected were those of lysol, cresol, chinosol, and common salt. Finally the injection of simple water, sterilized by boiling and cooled to blood heat, proved eminently satisfactory. In the use of these injections it came to be recogized that the more fully the udder was distended the better was the result.

Injection of Gaseous Agents.

Distension of the udder by gas was now a very obvious alternative, but although Schmidt had used some atmospheric air along with his iodide solution, the idea of antisepsis had so preoccupied the minds of the operators that for a time those gases only were used that had some antiseptic power. Kortman used etherized air with success. Oxygen got into very general use, first in Switzerland, then in London, Canada, and elsewhere, and as the quarters were well filled with the gas the mortality practically disappeared—every case recovered. The first case of the present writer, was a mature Jersey with a record of three pounds of butter daily. She was attacked within 12 hours after calving, and the case should therefore, in time past, have proved fatal. In one hour she was on her feet and by next day she had fully recovered, and has given her usual heavy yield of milk ever since.

Injection of Sterilized Atmospheric Air

Experiment had advanced so far that the conclusion was unavoidable that the value of the injection lay in its quantity rather than in its quality. The benefit came from the distension of the udder by *overfilling* of the milk ducts, and it mattered little what agent was used, provided that it was bland and non-irritating. This conclusion was strengthened by the experience of the breeders on the island of Jersey. Dealing with a paragon in the production of milk and butter, they had suffered heavy losses from milk fever, until they fell upon the expedient of omitting to milk out the udder for twenty-four hours after calving, which had at once the happiest result. The disease which had been the scourge of high class Jerseys was at once "shorn of its terrors."

It only remained to fully distend the udder of the afflicted cow with ordinary atmospheric air, which had been robbed of its living germs by filtration, and the triumph over milk fever became easy and complete. The first case to which I applied this was a mature half-bred Holstein, which had been attacked less than twelve hours after calving, and which had been injected with Schmidt's iodide solution, yet eight hours afterward remained down, unable to rise, in a condition of stupor, and with no sign of discharge of fæces or urine. On having my attention called to the case I at once fully distended the udder with sterilized air, retaining it by means of tapes tied around the ends of the teats, and in a little over two hours she was up seeking water and even food, passing fæces and urine freely, and with bright expression of face and eyes and every promise of recovery. The tapes were now taken off, but no milking allowed until the following day, when the patient appeared to be perfectly well. Since that date she has had the reputation of the best milker in the heavy-milking herd.

This case is an example of many others in many different hands, so invariably successful that there is good warrant for the assertion frequently made, that there need be little or no apprehension of a fatal result, in even severe cases of milk fever, if they are promptly subjected to treatment. The modern treatment acts like magic and seems to hardly admit of failure.

Economic Value of This Treatment.

The economy of the treatment is very far reaching. Milk fever has long been the scourge of the best dairy herds. Not only the best herds, but the best cows in these herds suffered, and the latter were lost to the owner at the very time when they were promising the highest remunerative returns. In this way the maximum value was continually being cut down, and the herd came to be made up of the less valuable, the less productive, and the less remunerative animals. Excellence and high yield were continually being scaled down, and the more intelligent and suc-

cessful the owner might be in grading his stock up to a high standard, the heavier were his losses. Not only so, but the element of heredity has come in to restrict the improvement in the herds, and to keep this below the standard which they were justly entitled to reach under intelligent skill, selection and management. The cows that have attained to an unprecedentedly heavy yield, under judicious breeding and management would produce a larger proportion of similar high class offspring, and were the most likely to bring forth those that would excel themselves even, so that, in the absence of a serious drawback, the constant appreciation of the herd, under judicious supervision, is a foregone conclusion. But so long as great success in such improvement, was the signal for the destruction of the most valuable products, the best milking cows, by this disease great individual advancement could only be rare, and a general advance to the highest standard became a virtual impossibility.

If, on the other hand, we can guarantee the recovery of even the most strongly predisposed animal from milk fever we have laid the foundation of a general grading up, while applied upon the dairy herds generally would increase their value to an almost incalculable extent. Every advance in excellence is a permanent gain, and as the cow of the highest standard can be counted on to live out her days, and to produce a full complement of equally high class offspring all dairy herds can soon be raised to this enviable condition.

Dangers of the Treatment and Need of Special Precautions.

We must not shut our eyes to the inevitable abuse and danger of the new treatment. The main danger is the introduction of germs into the udder, and the setting up of infective inflammation in the gland. Readers will recall the show cows in Toronto a few years ago, the udders of which were fatally infected by milk injected to make a false show in the prize ring. Already in Europe and in the hands of veterinarians the Schmidt treatment has induced a small proportion of cases of infective mammitis. How many more such cases will develop if this treatment shall become a popular domestic resort, applied by the dairyman in all sorts of surroundings, and with little or no antiseptic precaution? This result is inevitable, but we may feel some consolation in the thought, that even so, the mortality and loss must be far less than it has been in the past, when at least half the animals attacked by milk fever died.

To obviate such dangers entirely, the treatment must be applied under careful measures of asepsis, such as are used in all work in the bacteriological laboratory. From one who has not had the privilege of such laboratory training, be he veterinarian or layman, we cannot expect perfect results, but we can at least lessen the evils by giving full instructions as to the precautions necessary.

First. Provide an elastic rubber ball and tubes furnished with valves to direct the current of air as in a common Davidson syringe.

Second. On the delivery tube place a cylinder of tin, or other metal, made in two parts which telescope within each other, making an airtight joint, and pack this cylinder with sterilized cotton. On each end of the cylinder have a projection in the form of a fine tube on which the rubber tubes are fitted.

Third. In the free end of the rubber tube leading from the cylinder, fit a milking tube to be inserted into the teat.

Fourth. Sterilize this entire apparatus by boiling for 15 minutes, and, without touching the milking tube, wrap it in a towel which has been sterilized in a water bath, or in live steam, and dried and ironed.

Fifth. On reaching the patient, draw no milk from the teats, but wash them and the udder thoroughly with warm soap suds, rinse off with well boiled (and cooled) water, and apply to the teats, and especially their tips, a 5 per cent. solution of creolin or lysol, taking great care that the teats are allowed to touch nothing until the injecting apparatus is placed in use. As the cow is usually down, the udder

may be rested on a cushion or sterilizedcotton, or a sterile towel.

Sixth. All being ready the apparatus is produced, great care being taken to keep the milking tube from touching any object but the teat, and the middle of the teat being held between the finger and thumb of the left hand the teat tube is inserted into the milk duct with the right. Meanwhile the assistant manipulates the rubber ball until the quarter is as full as it will hold, when the tube is withdrawn and held by its attached end, while the teat is tied with a tape to prevent the escape of the air.

Seventh. The tube is now dipped in strong creolin or carbolic acid, rinsed off in water that has been boiled, and is used on the second teat as on the first, and in turn on the third and fourth, until all four quarters are thoroughly distended and teats tied.

Eighth. The recumbent cow is to be kept on her breast bone, and with the head elevated even if it should be necessary to pack her around with straw bundles or to suspend the head by a halter. Lying on her side is liable to develop fatal bloating.

Ninth. If in two hours the cow is not on her feet, nor looking brighter and more intelligent, if she has passed no manure nor urine, and if the air has become absorbed, leaving the udder less tense, the injection of the bag may be repeated under the same scrupulous and rigid antiseptic precautions as at first. This may be repeated later if necessary. In all cases, but especially in severe ones, it is well to keep watch of the cow for twenty-four hours, and if there is any indication of a return of the attack to repeat the treatment by udder distension.

Tenth. It is the common experience that when the cow gets on her feet or very shortly after, the bowels will move freely and the urine will be discharged copiously, indicating a resumption of the normal nervous functions, and furnishing one of the best guarantees of complete success. If such motions are wanting or limited in amount, the patient should be the more carefully watched, so that the earliest symptoms of relapse may be detected, and the treatment renewed.

Complications.

Complications must be met according to their nature. Bloating may require puncture of the rumen, evacuation of the gas and the introduction of ammonia solution or other anti-ferment. Inhalation of food-matters into the windpipe and lungs, causing bronchitis or pneumonia may demand antiseptic inhalants or even solutions, but is very liable to prove fatal. Injuries to the back or limbs may lead to a helpless condition of one or both hind limbs, which must be met according to its nature. Congestions or infections of the udder, womb, bowels, brain or other organs must be dealt with according to indications. If possible the case should be in the hands of an accomplished veterinarian, who is not only a trained bacteriologist, but a man of experience and skill in other respects. In the absence of such an one, the enormous mortality of the disease, when left to itself or treated according to the now obsolete methods would fully warrant an instant resort to the treatment by sterilized air, even at the risk of a small percentage of complications and fatalities.

THE ONTARIO UNION

By John W. Gilmore.

The 25th annual meeting of the Ontario Agricultural and Experimental Union was held at the Ontario Agricultural College, Guelph, Ontario, on December 7th and 8th.

This is the pioneer organization of its kind. It was established 25 years ago for the purpose of keeping the alumni of the Agricultural College in close touch with the activities of their alma mater, and with each other, and also to encourage and aid them in the continuation of their chosen lines of work. As it has grown in age and influence, the interests of the farmers of the province have been knit into the life and activities of the College until now these interests are united and all work in harmony for the advancement of agriculture.

During the past few years several organizations with similar objects have been established mainly in New York, Ohio, Illinois and Nebraska. Delegates from these organizations were invited to attend the convention at Guelph, but only the Agricultural Experimenters League, of N. Y., responded. Two speakers from the United States were on the program, Miss Martha Van Rensselaer, of Cornell, and Mr. W. J. Spillman, Agrostologist, U. S. Department of Agriculture.

C. A. Zavitz, director of co-operative experiments, reported that in 1902, 3,135 experimenters were engaged in this line of work in Ontario, while this year the number had increased to 3,845 and the work was more efficiently done. The co-operative experiment work was very satisfactory this year because of the deep interest the farmers had taken in it, and because of the training in judgment they received regarding the relation of crops to environment. Many speakers united to make an interesting and instructive program. The agricultural and economic conditions in Ontario differ materially from those in New York, and the union is working along lines somewhat different from our work, yet is it very evident that through the agency of the experimental Union substantial and lasting good is being accomplished. For intensity of effort and harmony of agencies engaged their work is admirable.

The meeting closed Tuesday evening, when somewhere in the neighborhood of 1,000 alumni with their wives, and others interested in Ontario's agriculture, sang "God Save the King." After having partaken of a sumptuous supper seasoned with toasts, President Mills turned upon the point that the time is now ripe for the experimenters to give their attention to the development, by selection and breeding, of the crops which they have so long tested for yield and adaptation to environment. Everyone went away with the feeling that this year's meeting was the best yet.

THE EFFECTS OF FOOD UPON CIVILIZATION

In a recent address at a meeting at Palo Alto, Cal., the seat of Stanford University, Professor I. P. Roberts of Cornell University spoke of the effect of food upon civilization, showing that those nations which used the most concentrated foods, which give a reserve of mental power, have attained the highest civilization. The Americans lead the world because they use more milk, butter sugar, fruit and wheaten bread than any other nations. The Turk, for instance, uses only one-tenth the sugar and one-fortieth of the butter that Americans use. No savage or barbarian people can be civilized until their food is improved. Neither can breeds of animals be improved without care in the food used.

Milk and butter are the most perfect foods, giving, in concentrated forms that are easy of digestion, all the elements needed. Butter, he said, is concentrated sunshine, and sunshine stimulates, as may be shown by the superior physical appearance of Californians.

Dr. Roberts showed plainly the necessity for the use of milk as food, and for the utmost care in producing and dispensing milk.—*Chicago Record-Herald.*

The Cornell Countryman

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JANUARY, 1904

Agricultural Teaching in Georgia

The present general assembly of Georgia has enacted a law requiring the elements of agriculture to be taught in the public schools. This is a step in the right direction. The majority of the people of the state earn their living on the farm, and it is only proper that the education of their children should prepare them for the life that they must lead. But there are difficulties in the way of accomplishing this. The greatest of which is to find teachers with the training that would fit them to teach the elements of agriculture.

The University of Georgia offers a three months' course of instruction in the winter, and a two months' course in the summer, to prepare teachers for this work. Georgia is abreast of the new educational ideas. She has a great problem to solve, and we are eagerly watching to see her victorious.

Crates for Shipping Apples

The high price and shortage of apple barrels this fall has caused some growers great inconvenience. In the end, however, it may prove beneficial, for it has forced the growers to ship their best stock in boxes. This form of package may seem strange to apple growers, but it is being used more and more every year, and is sure to grow in favor. The size of the package is more convenient than a barrel, for the latter is more than the city customer wants, and there are too many apples in a barrel to carry well without bruising. Select fruit sells better in small packages.

The Chicago Live Stock Show

The Fourth International Live Stock Exposition was held in Chicago last month. This is the greatest live stock show in the world, and is said to bring more people to Chicago than any other event except the World's Fair. It is pre-eminently a show of meat-producing animals, but the interest in horses, particularly of the draft type, is increasing. Some of the best, perhaps the best, draft horses in the world were exhibited.

The very active part taken by the agricultural colleges is noteworthy. Nearly every agricultural college of the Middle West sent a large delegation of students. Some groups numbered over 100. But the colleges were there as competitors as well as visitors. The *Breeders' Gazette* says, "Championships galore fell to the bullocks from these institutions. Specifically speaking, the Shorthorn, the Angus and the grade championships went to colleges, and the grand championship and reserve also. Then four of the beef carcas prizes also fell to college entries. Remarkable things were done by college swine and sheep." In fact, some of the exhibitors are beginning to feel it a hardship to have to compete with the "impractical professors." The best thing about this showing is that it will call the attention of many a farm boy to the work of the colleges.

The agricultural colleges of Iowa,

Minnesota, Kansas, Ohio and South Dakota sent teams to Chicago to compete in judging stock. The Spoor trophy, a bronze cast of a bull, goes to the best team. The Iowa college has held this for two years. There are also $500 to be divided among the twelve students making the best individual scores.

The Mexican Cotton Boll Weevil

The Mexican cotton boll weevil is at present one of the most discussed problems in southern agriculture. This pest came into Texas from Mexico about ten years ago and soon began to attract attention. It has since spread over much of Texas and threatens the cotton-growing industry of the whole South. Something of its importance can be seen from the fact that the state offers $50,000 to anyone who can devise a practical means of exterminating it. A convention of some 1,200 farmers met at Dallas the first part of November to consider ways and means of averting the danger to the cotton interests.

In a letter published in *Science* Dr. Howard says that if the legislature of Texas had acted upon the advice given by the Division of Entomology in 1897, the pest could have been confined to a small area in southern Texas and possibly might have been exterminated. He also states that experimental demonstrations have shown that a fair crop can be grown in spite of the weevil. This fall a crop of from a half bale to one bale per acre was harvested from controlled land, while in adjoining territory the average crop did not exceed one bale to from six to fifteen acres.

The methods that have given best results in fighting it are, growing early varieties and planting early, late cultivation, the destruction of the stalks as soon as the crop is gathered. The growing of other crops is also recommended, not only to avoid the weevil, but because it will pay to have a more diversified agriculture.

Meeting of the A. A. C. and E. S.

One of the editors had the pleasure of attending the seventeenth annual convention of the Association of American Agricultural Colleges and Experiment Stations, held at Washington. There were over two hundred present, nearly all of whom were men having positions in agricultural colleges or experiment stations. This number was surely representative of all the different agricultural divisions in the United States. On glancing over the list of delegates, one might question whether any state or territory were not represented.

Matters that attracted much interest and discussion were Bulletin 22 of the U. S. Bureau of Soils, military education in land grant colleges, and agricultural education in land grant colleges. The much talk of "bulletin 22" was the subject of some unfavorable criticism. It evidently furnishes a large field for contention between the soil physicist and the soil chemist; for, unchallenged, it would shift the emphasis from the chemical to the physical side of soil study and operations. It had its severest critic in Professor E. W. Hilgard, who sent in an able address to be read. Dr. H. W. Wiley, chief of the Bureau of Chemistry, U. S. Department of Agriculture, told of the intelligent nature of the investigations, and of the care with which the conclusions were drawn. The opinion of the more unfavorable critics is that conclusions were too hastily

drawn, and were grounded on insufficient and particularly favoring results of investigations.

The expression in regard to military education was pretty generally to the effect that it had fallen below the standard of a few years ago; the time given to instruction being very much lessened, and the character of that instruction being inferior. What is needed is more generosity on the part of the government, and the detailing of efficient instructors. President Atherton's remark in regard to conditions is significant—that the War Department details a man for instruction in some institution, of which he usually comes to take charge. The instructor should be recognized as one of the faculty, and should understand his position among the rest.

The discussion relative to agricultural education was concerned with details and curricula very largely to the exclusion of broad principles and movements. Director A. C. True, as head of a committee, reported on methods of teaching agriculture in colleges; illustrating by many charts a very comprehensive system. Discussion on the matter of teaching agriculture in the rural schools came as a corollary to the main discussion, and many appeared only then aware that there was any movement in this regard. It seemed as if they were being pushed by the movement rather than they pushing it.

The association instructed its executive committee to ask Congress for an increased appropriation for the experiment stations. Each state now gets $15,000, an amount much too small to meet the present needs.

The meeting evoked considerable interest; but is is a question whether, on the whole, the subjects for address and discussion were usually of sufficient general interest or comprehensive and broad enough to awaken the enthusiasm and spontaneity that surely might obtain among such men and at such a meeting.

The New Farmer and a New Earth

Again we feel inclined to express our appreciation of the *World's Work*, which is doing so much to elevate agriculture in the opinion of its many readers, and to encourage the farmer, student and experimenter.

December's number has two articles on agricultural topics. The first, "The New Farmer and a New Earth," is the beginning of a series by Professor B. T. Galloway, Chief of the Bureau of Plant Industry, U. S. Department of Agriculture. The article has a highly optimistic strain, showing the remarkable revolution which agriculture has undergone, and the immense advantages to the nation of the great improvements in ideals and methods. A profusion of pictures contrasting the new with the old, adds illustration to affirmation to convince one of the progress and dignity of farming. The man in the laboratory is given great credit and the man on the farm is commended for his adaptibility and progressiveness.

It is an improved agriculture more than anything else that has made America the wonder of the world. The tiller of the soil owes his emancipation to the improved agriculture and all that it brings with it. Rice is produced on immense acreages where it was thought it would not grow, and has brought wealth to a heretofore poor country. Within the last three years Russian wheat has been grown with great success in the dry plain country of the Northwest, and this year will probably supply enough

seminola to render the heretofore large importation unnecessary. Seminola is the flour used in macaroni manufacture. Dairying and the animal industry of the South have been greatly benefited by science.

These are examples of the results of investigation and effort on the part of "men trained to see, to learn, and to do." "Agriculture is now a diversified industry. * * * The modern farmer is concerned with large areas of land. * * * The up-to-date farmer must have a system, and this must be correlated and harmonized with the surroundings." The farmer must have business intelligence as well as farming intelligence. Intuitive foresight may be successful, but it is too uncertain. "It is the man who does things, and knows why he does them, who reaches the top."

Life in the Corn Belt

T. N. Carver, professor of economics in Harvard University, writes the other article, "Life in the Corn Belt." December's COUNTRYMAN mentions Professor Carver's November article "Corn Growing and the Corn Growers," in which he describes his trip on horseback through the corn belt. The present article deals with social and economic conditions in the corn belt.

The western farmer is observed to be well informed, especially in the politics of his state; but he lacks acquaintance with many of the essentials of culture. He is keen at buying and selling, and evinces a fair proficiency in the business and technical sides of his operations. In the corn belt we have a condition of things not usual to less prosperous agricultural sections. There the abler men stay on the farms, while the town and small city populations are made up of men inefficient physically or mentally, and of retired farmers. A class of "tired" farmers live in the towns, and should be sharply distinguished from the "retired," who have made a success of farming. Farm life is certainly superior to town life in the corn belt.

There is no serious labor problem. "The typical farm hand is a young unmarried man, usually the son of a farmer living in the neighborhood—though frequently a foreign immigrant—who 'works out' for a few years merely to get money enough to begin farming on his own responsibility on a rented farm. Under such conditions it would be manifestly impossible to organize a successful labor union among farm hands. * * * This scarcity of farm labor, however, in no way interferes with the success of corn growing." Riding plows and other machines make it possible for small boys and even girls to accomplish a great deal of the farm work. "On a typical corn farm there is no season which is pre-eminently the busy season, unless the corn-plowing has fallen behind because of wet weather." Corn is recognized as the most profitable crop; but, since with a given labor force only so much corn can be grown, and there is need of no more labor force to grow several other crops in addition, wheat and oats are grown considerably. "Thus the farmer in the corn belt has practically eliminated the labor problem." There is practically no problem of domestic service. "Every farmer's wife expects to do her own work."

"As applied to country districts, the great question is—and it is by far the most important and far-reaching question relating to rural life in America—can we ultimately develop a rural population with a high standard of living, or must the land continue to pass into the hands of a population with a low

standard of living, but great industry? This is a question which goes to the very foundations of American civilization. Upon its answer depends the question whether the rural districts—the great seed-bed of our population or of any population, for that matter—shall be the home of a cultured, progressive, liberal-minded people, or of a 'peasant-minded' people.

"The corn belt is the most considerable area in the world where agriculture is uniformly prosperous. This prosperity is, moreover, healthful and natural. * * * The people engaged in the corn-growing industry are an independent, progresive class, drawing their sustenance from the soil, and not from other people."

Dr. Carver received his Ph. D. at Cornell. While a student here, he rowed on the crew.—Editors

GENERAL AGRICULTURAL NEWS

The University and Experiment Station of Wyoming has received as a gift from the State Board of Charities the penitentiary buildings and farm in Laramie. This adds to the college and station equipment a farm of 320 acres, situated on the Laramie River, and buildings costing originally about $100,000.

* * *

The new live-stock and grain-judging pavilion at the Iowa College is nearing completion. It is an octagonal building, built of pressed brick and two stories high. The lower floor will be used for animal husbandry work, and the upper floor for the judging of and demonstrations upon corn and grain. The building will cost when completed about $15,000.

* * *

The special course in Agriculture, which has been given at the Scientific School of Yale University for twenty-five years, has been discontinued on account of the retirement of Professor Brewer.—*Science.*

The Idaho College and Station has decided to add an agronomist to its staff to take up work in plant breeding and soil physics. A bacteriological laboratory will also be established.

* * *

The Iowa Agricultural College offers a two weeks' course in judging, feeding, breeding and management of live stock, beginning January 4. The work is intended for busy men who cannot take an extended course in agriculture. This is the fourth year that it has been given. It has proved so popular that accommodations have been made for 1,000 students. One of the features of the work is a slaughter test in which animals representing the various beef types are inspected on foot, then killed, cut up, and discussed.

* * *

The Bureau of Soils has fifteen parties in the field, in the southern and western states. These parties are shifted with the seasons, working in the north in summer and in the south in winter. A party of nine is working on the storage reservoir problem in Arizona. Most of the parties consist of two men. The Bureau has mapped 34,000,000 acres at an average cost of $3.10 per square mile.

* * *

At the close of the last session of the English House of Commons a bill was introduced making agricultural and horticultural instruction compulsory in all schools in rural and semi-rural districts.

* * *

An interesting event in the development of horticulture in the University of Missouri took place December 10, when the new horticultural building was dedicated. The exercises were attended by the state fruit growers in a body. Addresses were given representing the educational and commercial sides of horticulture. Professor Craig gave the former, and J. H. Hale the latter. The building is a substantial stone structure, costing $40,000. It is built by the state.

CORNELL NEWS

CAMPUS NOTES

In 1892 the University herd of Holsteins gave an average annual yield of 273 pounds of butter fat, equal to 318 pounds of butter. In 1902 the descendants of these same cows gave an average annual product of 301 pounds, equal to 351 pounds of butter.

* * *

Within the last year the University farm has been much changed. The Board of Trustees has given to the Athletic Association 55 acres from the south side of the old farm. Twenty-two acres on the east part of this will be made into an athletic field. The 33 acres bordering Garden Avenue will be a play ground for tennis, lacrosse, cricket, etc., where any one may indulge in the game that he likes. The Trustees have more than made up for this reduction by the purchase of additional land east of the old farm. The new portions are the Mitchell farm of 108 acres, the Preswick farm of 56 acres and the Behrend farm of 44 acres. These changes give a farm of 248 acres, of which 92 acres is arable, 93 acres pastures, 49 wood and waste land. Besides this, they have leased another farm of 94 acres.

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The first annual meeting of the Agricultural Experimenter's League of New York will be held January 8-9 Secretary Wilson of the United States Department of Agriculture or his representative will be here. Director Bailey will speak, and reports of the year's experiments will be given.

* * *

Among other courses given by the horticultural department, is one dealing with the construction of various types of modern greenhouses. Through the generosity of some of the leading horticultural builders and manufacturers of greenhouse material we have been enabled to give a very practical course of instruction in this line. At present there is in course of construction a curvilinear, iron framed house, which was furnished by the Lord & Burnham Co. of Irvington, N. Y. We have also on hand two other houses of different styles, furnished by the Dillon Construction Co. of Bloomsburg, Pa., and A. T. Stearns Lumber Co. of Boston, Mass., which will be erected soon. Other companies have expressed their desire to furnish houses of their type of construction when the class is ready to erect them. Arrangements have been made so that students interested in this work can carry it on throughout the year with profit.

* * *

Professor Wing has purchased sixteen steer calves from the west. There are five Herfords, five Galloways, three Shorthorns and three Angus. All are high grades. They will be used for instruction purposes and for feeding experiments. The high price of meat has caused a growing interest in beef cattle in the East. These, added to the Holsteins and Jerseys of the dairy give us a representative herd.

* * *

The normal institute mentioned in the last number of the COUNTRYMAN was held from November 30th till December 4th. There were ten sessions in all, in which were engaged sixteen professors and instructors, including Dr. Jordan, of Geneva, and Mr. Flanders assistant commissioner of agriculture. The subjects of instruction were: bovine and human tuberculosis, soil chemistry, soil investigation, the importance of water in plant production, the characteristics of soils, the improvement of field crops, forage and soiling crops, recent experiments with alfalfa and other legumes, pastures and meadows progress in plant breeding, synopsis of experiments with dust spray, troublesome insects of the year, spraying to destroy wild mustard, foundation principles of animal breeding, milk sanitation, the horse, and agricultural law. Two social evenings were enjoyed at the homes of Director Bailey and Professor Craig.

There were about thirty in atten-

dance, whose names follow: F. E. Dawley, director; Fred S. Arnold, Alva Agee, Professor S. A. Beach, C. E. Chapman, H. E. Cook, J. D. Clegg, J. G. Curtis, Chas. M. Day, Emmons Dunbar, John Ennis, Professor Eustace, Andrew Elliott, Dr. E P. Felt, Fred. E. Gott, Professor H A. Harding, Hon. John Hamilton, T A. Hoverstad, John Jeannin, Jr., Professor P. G. Parrot, Geo. T. Powell, Prof. F. H. Stewart, Geo. A. Smith, Dr. C. D. Smead, F. A. Sirrine, F. G. Tice, Edward Van Alstyne, Henry Van Dreser, Jared Van Wagnen Jared Van Wagnen, Jr., J. O. Wadsworth, D. P. Witter, J. S. Woodward.

* * *

Director Bailey and Professors Hunt and Pearson gave addresses at the New York State Dairymen's Association. This association passed a resolution asking the State Legislature to provide a building for the College of Agriculture.

* * *

Professor Stone is getting out a bulletin on spraying for the eradication of mustard. The co-operative experiments with the copper sulphate spray have been entirely successful. It has saved many dollars for those using it.

* * *

A new feature is being started in connection with the poultry department. A Cornell Poultry Association has been formed. It is the purpose to hold a poultry show each year. Students will choose fowls from the University flock and will fit them for the show. Awards will be made to those who present the best fowls.

* * *

An incubator house is now being constructed. When it is completed it is thought that Cornell will have as good an equipment for poultry work as any college in the country. Professor Rice and the students are doing much of the work of construction.

* * *

A ginseng bed has been established and will be further added to next spring. The various problems that confront the ginseng grower will be studied.

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Among the numerous experiments being conducted with potatoes, is one that has for its object the improvement of the quality.

* * *

G. W. Bush, '07, was called home on account of the death of his father. He will not be able to return for some time, if at all this year.

* * *

Scott H. Perky, Sp. Agr., associate editor of THE COUNTRYMAN, is about to start on an extended trip through the West Indies and Southern United States, where he will study rural conditions. Articles written from these countries will appear in this magazine.

* * *

G. N. Lauman spent his Christmas vacation in Florida.

* * *

Professor A. D. Selby, botanist of the Ohio Agricultural College, Wooster, Ohio, visited us in the early part of December.

* * *

Professor J. W. Decker of the Ohio State University Agricultural College visited the University on his return from the New Hampshire Dairymen's convention.

ADDITIONS TO THE FACULTY

With the reorganization of the College of Agriculture several notable additions have been made to the faculty and brief sketches of these men will certainly be of interest to all former students. These additions are:

Thomas Forsyth Hunt, professor of agronomy and manager of the University farms. Professor Hunt received his preliminary education at the Freeport, Illinois, high school, and took his bachelor's degree in science at the University of Illinois in 1884. After graduation he held in succession the positions of assistant to the Illinois State Entomologist, assistant in Agriculture at the University of Illinois, and assistant to the Illinois Experi-

ment Station, and in 1891 he was appointed professor of agriculture in the Pennsylvania State College. The following year he was called to the professorship of agriculture in the Ohio State University, which position he has held until the time of his present appointment, having, in the meantime, filled the office of dean of the College of Agriculture and Domestic Science of Ohio State University since its establishment in 1896, and that of registrar of the Graduate School of Agriculture. He received his master's degree in science from the University of Illinois in 1892, and in June, 1903, the same institution conferred upon him the honorary degree of D.Agr. Professor Hunt is a member of the Society for the Promotion of Agricultural Science, and has taken an active interest in the Association of Agricultural Colleges and Experiment Stations, having been indentified with a number of its important committees. His numerous publications have embodied the results of his many and extensive investigations in the field of agriculture and allied subjects.

Raymond Allen Pearson, professor of dairy industry. Professor Pearson was born in Indiana, but removing to the East he graduated from the Ithaca High School, and entered Cornell University, graduated from the agricultural course in 1894, and later secured the master's degree. During his senior year he assisted in the laboratory instruction of the first dairy course given in the University. After graduation, he engaged in the milk business in Philadelphia, but when the Dairy Division of the National Department of Agriculture was organized with Major H. E. Alvord as chief, Professor Pearson was made assistant chief, which position he held until 1902. He then became general manager of the Walker-Gordon Laboratory Company, a concern with headquarters in New York and operating branches in sixteen large cities, that makes a specialty of modified milk for infant feeding and high class milk for domestic purposes. Professor Pearson is Fellow of the American Association for the Advancement of Science, and has contributed several important bulletins and reports to dairy literature.

Jay A. Bonsteel, professor of soil investigation, secured his preparation for college work at Franklinville, N. Y. He was graduated with the degree of B. S. from Cornell University in 1896, and held the position of assistant in geology for three years. In 1898 he secured employment on the Maryland Geological Survey, and pursued a a course leading to the degree of Ph.D. at Johns Hopkins University, where he was graduated in 1901. He has been employed as field assistant scientist in the Bureau of Soils of the U. S. Department of Agriculture since June, 1899, and is assigned by the Bureau of Soils to carry on the soil investigation work at Cornell. Professor Bonsteel's publications have been issued through the annual reports of the Bureau of Soils.

James Edward Rice, assistant professor of poultry husbandry, was born in Illionis but was brought up on a farm in Washington County, N. Y. His preparatory education was at the Granville Military Academy. He entered Cornell University in 1886, and graduated in the course in agriculture in 1890. For three years he was a graduate student and assistant in agricu'ture, and during this time gave the first definite course of instruction in poultry husbandry ever given in an American agricultural college. Most of the time since 1893 Profesor Rice has been engaged in poultry, fruit and truck farming, at Yorktown, N. Y., in connection with his brother-in-law, under the firm name of White & Rice. The firm has obtained an enviable reputation as a producer of high class products. For the past ten years Professor Rice has taken an active part in Farmers' Institute work, and has been a regular lecturer in New York each year. He has also spoken in New Jersey, Maryland, Minnesota, Connecticut, Rhode Island and Pennsylvania. His contributions to the agricultural press have been numerous and important.

S. W. Fletcher, assistant professor

of extension teaching in agriculture. Professor Fletcher was born on a Massachusetts farm, graduated from the Massachusetts Agricultural College in 1896, then became assistant horticulturist at the Experiment Station of the same state. In 1897-'98 he was a fellow in horticulture in the University, and assisted in instruction in the Extension Department until 1900, when he became professor of horticulture in the Washington State College at Pullman. In October, 1902, he became horticulturist of the West Virginia Experiment Station, which position he has resigned to come to Cornell.

John Main Trueman, assistant in animal husbandry and dairy industry takes the place left vacant by the resignation of Mr. James A. Foord, who is now professor of agriculture in Delaware College. Mr. Trueman is a native of Nova Scotia, and a graduate of the Agricultural School at Truro. He graduated from Cornell University in Agriculture, 1895. He was for two years instructor in dairy husbandry in the South Dakota Agricultural College, and since then has been manager of a large dairy farm in south eastern Pennsylvania, and of a gentleman's country place near Scranton.

Samuel Frazer, instructor in agronomy and superintendent of the University farm, was born in England, took a short course in dairving at the Worleston Dairy Institute, Cheshire, England, 1895-6. Graduated with first place at the Cheshire Agricultural and Horticultural College, Holmes Chapel, England, June, 1898. He has secured the following diplomas and medals: Fellowship, life-membership and diploma (with first place) of the Highland Agricultural Society of Scotland in April, 1898; silver medal, free life-membership and diploma, Royal Agricultural Society of England, May, 1898; medal and honors' certificate in Agriculture, Science and Art Department, London, June, 1898; national diploma in dairying, September, 1898. Since then he has been engaged in various forms of farm and experimental work, and in giving agricultural instruction.

Robert S. Northrup, instructor in horticulture, comes to us from North Dakota Agricultural College, where he had been assistant in horticulture and forestry for two years. He graduated at the Michigan Agricultural College in 1901.

James A. Bizzell, assistant chemist to the Experiment Station, graduated at the North Carolina College of Agriculture and Mechanic Arts in 1895, and received his M. S. in 1900. From 1895 to 1901 he was instructor in chemistry and assistant in the experiment station of his alma mater. In 1901, he came to Cornell as fellow in chemistry, received his Ph.D., and was appointed to his present position last June.

With the addition of these new men there have also been numerous promotions and transfers.

Professor Bailey, as is well known, became director of the College and Experimant Station and Dean of the Faculty. He relinquishes the professorship of horticulture and becomes professor of rural economy.

Professor Wing's chair has been divided, he retaining the professorship of animal husbandry.

Professor Craig is transferred from the professorship of extension teaching in agriculture to that of horticulture.

Mr. G. N. Lauman becomes secretary of the College and instructor in rural economy.

Mr. G. W. Cavanaugh is promoted from assistant chemist of the Experiment Station to assistant professor in chemistry in its relation with agriculture.

Mr. John L. Stone is promoted to assistant professor of agronomy in charge of extension work.

FORMER STUDENTS

'89, B. S. Agr.—Geo. H. Davidson is on his farm at Millbrook, N. Y. He is one of the most noted Shropshire breeders in the United States.

'94, B. S. Agr.—Harry Hayward, after graduating was appointed professor of dairy husbandry in the Pennsylvania State College. He received his master's degree in '01, in absentia, and December, '02, was made professor of animal husbandry at the New Hampshire Agricultural College. Last May he was appointed assistant chief of the dairy division, Department of Agriculture, Washington, D. C. He resigned this position in July, and is now farm superintendent of Mr. Moody's school, Northfield, Mass.

'96 B. S. Agr.—Leroy Anderson '97 M. S. Agr., '02, Ph.D. Mr. Anderson was Professor Wing's assistant in dairy husbandry until the summer of 1901, when he went to Berkeley to develop the department of dairy husbandry at University of California. He returned to receive his doctor's degree in June, '02, and was immediately called to the directorship of the California Polytechnique School at San Luis Obispo. Professor Anderson still occupies this position.

'97, B. S. A.—James Wheaton Clark is assistant agent of W. O. Wadsworth, Geneseo, N. Y. Mr. Clark used to ring the chimes in his student days at Cornell. His brother, Willard W. Clark, F. E. '02, is a forester in the Philippines in the employ of the U. S. government.

'98, B. S. A.—John Gilmore spent two years in China, taught agriculture in Honolulu, and was director of the government experiment works in the island of Negros. Mr. Gilmore embodied the results of some of his work in the island of Negros in a preliminary report on "Commercial Fibers of the Philippines," published as Bulletin 4 by the Philippine Bureau of Agriculture. Last fall Mr. Gilmore returned to Cornell as assistant in agriculture.

'98, B. S. A.—H. C. McLallen, '01 M. S. in Agr., has lately been appointed assistant in agriculture in the New Mexico College of Agriculture and Mechanic Arts at Mesilla Park, New Mexico. He married Miss Helen Macgregor, November 25th.

'98, Sp. in Agr.—Edgar Salinger is manager of the "Plasmon" factory at Briarcliff Manor, N. Y.

'98, Winter Dairy.—C. A. Grant is manager of a large creamery at Fulton, Kansas.

'98, M. S. Agr.—In the last mail J. E. Higgins of Manoa Valley received his commission from the Department of Agriculture as U. S. Horticulturist He has joined the staff of the Experiment Station. Mr. Higgins is a graduate of Cornell University, and an expert in his line.—*The Pacific Commercial Advertiser*, Honolulu.

'00, B. S. in Agr.—L. C. Corbet, '96 M. S. in Agr., Horticulturist of Bureau of Plant Industry, is the author of a bulletin on "Cranberry Culture," recently published by the Department of Agriculture.

'00, B. S. A.—Franklin Sherman, Jr., who is State Entomologist for North Carolina, was married May 12th, '03, to Grace Berry, of Ashgrove, Fairfax County, Va.

'00, Graduate Work.—L. A. Clinton, '89, B. S. Michigan Agr. Col. Mr. Clinton came to Cornell in the fall of 1899 as Professor Roberts' assistant in agriculture. During the past year he has been director of the Connecticut Agricultural Experiment Station, which position he accepted in November, 1902.

'00, B. S. A.—Otto F. Hunziker, '01, M. S. in Agr., was appointed instructor in bacteriology in the Cornell Veterinary College, but now holds an important position with the Scranton Condensed Milk Co., of Ellicottville, N. Y.

'00, M. A.—Jacob G. Lipman, '98, B. S. Rutgers. Mr. Lipman received his Ph.D. at Cornell, June, '03, and is now soil chemist and bacteriologist at the New Jersey Agricultural Experiment Station.

'00, A. M.—C. O. Simpson was for three years in the employ of the Government under Dr. L. O. Howard, entomologist. He is now in South Africa, holding the position of Government Entomologist of the Transvaal, with a salary of $5,000 a year. This is one of the many cases that illustrate how foreign governments are securing our

best scientists by offering them better salaries than they can get at home.

'01, Sp. Agr.—H. S. Stone is farm manager of the Sailors' Snug Harbor, New Brighton, N. Y.

'01, Sp. Agr.—B. C. White is engaged in agricultural work at Olyphant, Lackawanna county, Pa.

'02, M. S. in Agr.—Robert E. Eastman, '00, B. S. A., Kansas Agricultural College. During the summer of 1902 Mr. Eastman was employed by Miller Brothers on their large peach farm at Pawpaw, West Virginia. He was then called to Hampton Institute as landscape gardener and field assistant in horticulture. He is now back at the Kansas Agricultural College, where he was appointed assistant in horticulture, September, 1903.

'02, Sp. in Agr.—Harry E. Crouch was well known during the three years that he was at Cornell. He took charge of the Polled-Jerseys in the Model Dairy at the Pan-American Exposition, and is now herdsman at the University of Illinois.

'02, Sp. in Agr.—Earl D. Crocker is applying his agricultural theories at Sennett, N. Y.

'02, B. S. A.—George W. Hosford is assistant in agriculture at Hampton Institute, Hampton, Virginia.

'02, B. S. A.—T. M. Sewards is vice-president, and T. F. Sewards, his brother, is secretary of the A. H. Schultze Co., 198 West Broadway, New York City.

'02, B. S. A.—Charles H. Kraatz is on his farm at Akron, N. Y. Recently he has been testing cows for Professor Wing at Wycoff's, Navarino, N. Y.

'02, B. S. A.—Charles W. Wenbourne is secretary of the Horse World Co., publishing the *Horse World*, Buffalo, N. Y.

'03, Ph.D.—E. P. Sandsten, B. S. and M. S. at University of Minnesota. Mr. Sandsten is now profesor of horticulture in the University of Wisconsin.

'03, Sp. Agr.—D. C. Stanion sailed for England on December 10th to purchase Cheshire hogs for Mr. Huson of the Kalorama Farm, Penn Yan, N. Y. He will also make purchases for other parties.

FIRST DAIRY CLASS, 1894

Earl B. Willey, 223 Front Street, San Fransisco, Cal., has been in dairy work for the past four years.

G. W. Breckenridge, Stacy Basin, Oneida County, N. Y., followed the business of butter and cheese making at Higginsville and Fonda, N. Y. until the fall of 1901. He then bought a farm of 200 acres near Stacy Basin and is now actively engaged in farming.

J. E. Dorman, Thalia, Princess Anne county, Va. After leaving Ithaca Mr. Dorman ran a creamery in New Jersey for a year, but left this to take charge of a model dairy farm near Philadelphia, where he remained for three years. He then accepted his present position as manager of an 1,800 acre truck and dairy farm, which has also extensive oyster beds on the Lynnhaven River. Mr. Dorman says that his training at Cornell has been a great help to him. Every move he has made has been in response to an increase in salary until at the present time it amounts to $1,500 a year. He adds that the most important event that has happened to him since the winter of 1894, is his marriage in 1899 to Miss Katherine Fredricks of Washington, D. C. They have a son that he hopes one day will be a student at Cornell.

Herbert Hoopes, V. M. D., Bynum, Hartford county, Maryland, was the youngest man in the dairy class of 1894. He had charge of their home creamery until the fall of 1896, when he entered the Veterinary Department of the University of Pennsylvania graduated in 1899, and has since been practicing, with headquarters at home, where he has a dairy of 200 registered Jerseys. Dr. Hoopes was married two years ago this January.

Peter Langwell, Wolcott, N. Y. Rockford, Ill., is Mr. Langwell's old home, but Wayne County has been the scene of his labors for the past nine years. He has been with the Sodus

Co-operative Creamery Co., since the company started. H. B. Douglas, who was a student in the dairy school, is their butter maker at Wolcott, and A. S. Chaplin, graduate of Wisconsin's dairy school, holds the same position at Sodus. Mr. Langwell is secretary, treasurer and manager of the company's plants, and is a busy man.

George L. Lucas, Pawling, N. Y. was in a butter factory before coming to Cornell, and since 1894 has continued to follow the milk and it products. He made butter until 1898, and then went into the bottling business He is now in charge of one of the large bottling plants of the Slawson-Decker Co., located 64 miles from New York in a rich farming section of the Harlem valley. Mr. Lucas employs nine men, and ships about 9,000 quarts of bottled milk daily.

Frederick H. Merry, Verona, N. Y. During the year of 1899 Mr. Merry was in the employ of James P. Brown's Sons of Utica, N. Y., dealers in cheese, both for home and export trade. His main work was visiting the factories and inspecting the cheese. Since 1894 with the exception of the year mentioned, Mr. Merry has been in charge of the butter and cheese making in the G. Merry cheese factory and creamery located at Verona, N. Y.

(TO BE CONTINUED.)

Cornell University

College of Agriculture

The College of Agriculture is one of several coordinate colleges comprising Cornell University. The work of the College of Agriculture is of three general kinds: The regular teaching work; the experiment work; the extension work. The courses of instruction fall in the following groups:

1. Four-year course, leading to the degree of Bachelor of the Science of Agriculture. As a variation, the last two years may be chosen in subjects pertaining to landscape architecture and outdoor art. In the Graduate Department of the University, students receiving the above degree may secure the Master's and Doctor's degrees (M. S., A., and Ph. D.)

2. Special two year courses. (a) Agricultural Special. (b) Nature-Study Special.

3. Winter-Course of 11 weeks: (a) General Winter Course. (b) Dairy Course.

Staff of the College of Agriculture, 1903.

L. H. Bailey, Director.

I. P. Roberts, Professor of Agriculture, Emeritus.

Agronomy:
T. F. Hunt,
S. Fraser,
J. L. Stone,
J. W. Gilmore,
G. W. Tailby.

Animal Husbandry:
H. H. Wing,
J. M. Trueman,
J. E. Rice (Poultry Husbandry).

Dairy Industry:
R. A. Pearson,
J. M. Trueman,
H. C. Troy,
W. W. Hall,
W. H. Griffith.

Horticulture:
John Craig,
R. S. Northrop,
S. W. Fletcher,
C. E. Hunn.

Agricultural Chemistry:
G. C. Caldwell,
G. W. Cavanaugh,
S. A. Ritzell.

Soils:
J. A. Bonsteel.

Entomology:
J. H. Comstock,
M. V. Slingerland,
A. D. McCulloway,
W. A. Riley.

Plant Pathology:
James E. Van Hook,
H. H. Whetzel.

Rural Economy:
L. H. Bailey,
G. N. Lauman.

Nature Study:
J. W. Spencer,
Mrs. Comstock,
Alice G. McCloskey.

Reading-Courses:
S. W. Fletcher,
Martha Van Rensselaer.

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